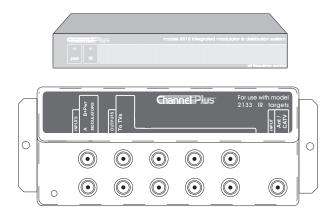# ChannelPlus ®

PERFORMANCE MULTI-ROOM VIDEO

Multi-room Video Distribution System
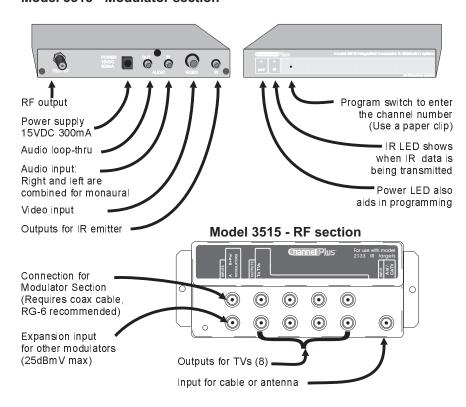## Installation Manual

Model 3515

This device complies with the FCC's Part 15 Rules for TV interface devices. Any change or modification to this device without the permission of Multiplex Technology, Inc. may void the user's authority to operate this equipment.

multiplex ®
technology, inc.

Controls and Connections

This ChannelPlus model 3515 video distribution system contains a digitally-tuned video modulator that converts any baseband video and audio signal to a user-selected UHF, or Ultraband CATV channel. An internal quartz crystal reference oscillator and PLL circuitry ensure drift-free performance. The user selects the output frequency (channel) using the "program" button to enter the number of the desired channel. Optionally, the model 3515 may be programmed by a computer running Windows 95. Any TV connected to the output via coax can receive the signals, when the TV is tuned to the proper channel.

Model 3515 - Modulator section

RF output

Power supply 15VDC 300mA

Audio loop-thru

Audio input: Right and left are combined for monaural

Video input

Outputs for IR emitter

Program switch to enter the channel number (Use a paper clip)

IR LED shows when IR data is being transmitted

Power LED also aids in programming

Model 3515 - RF section

Connection for Modulator Section (Requires coax cable, RG-6 recommended)

Expansion input for other modulators (25dBmV max)

Outputs for TVs (8)

Input for cable or antenna

Programming the model 3515 by computer:

You may program the channel assignment from a front panel switch or by a computer running Windows 95. You will need to download the instructions from our web site, http://www.channelplus.com. The files are located in the "Integrated Modulator" section. Run the program to extract the files and follow the instructions in the readme.txt file.
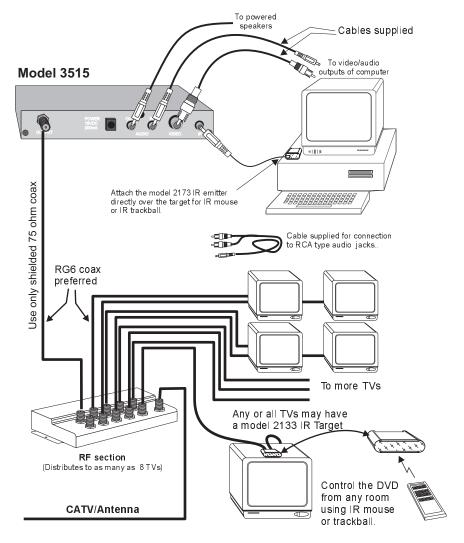
You must have a sound card capable of generating 'wav' files.

An audio loop thru is provided so that the 3515 may be placed between the computer and speaker system.

Sample System Diagram

In this system, CATV or antenna channels are available on all TVs. In addition, the DVD player inside the computer will play DVD movies on channel 70 on all TVs.

To powered speakers

Cables supplied

Model 3515

To video/audio outputs of computer

POWER 15VDC 300mA

AUDIO   VIDEO

Use only shielded 75 ohm coax

Attach the model 2173 IR emitter directly over the target for IR mouse or IR trackball.

Cable supplied for connection to RCA type audio jacks..

RG6 coax preferred

To more TVs

Any or all TVs may have a model 2133 IR Target

RF section
(Distributes to as many as 8 TVs)

CATV/Antenna

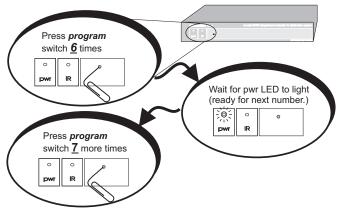Control the DVD from any room using IR mouse or trackball.
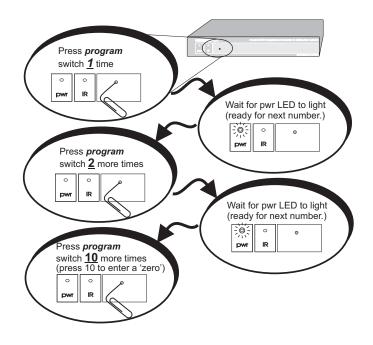
Expansion port
The 3515 RF section has an expansion port to allow for additional video modulators. E.g. you may add a front door camera that would be viewed on channel 73 and an LV player viewed on channel 75. The expansion port has > 85dB of antenna isolation required by FCC part 15 when using video modulators with an antenna.

Manual Programming Examples:

To program modulator to channel **67** (2 digit channel #)

Press **program** switch **6** times

Wait for pwr LED to light (ready for next number.)

pwr   IR

Press **program** switch **7** more times

pwr   IR

To program modulator to channel **120** (3 digit channel #)

Press **program** switch **1** time

pwr   IR

Wait for pwr LED to light (ready for next number.)

pwr   IR

Press **program** switch **2** more times

pwr   IR

Wait for pwr LED to light (ready for next number.)

pwr   IR

Press **program** switch **10** more times (press 10 to enter a 'zero')

pwr   IR

Valid Channels: 14-64: UHF channels
65-125: CATV channels
95-99: not valid

Channel Spacing: Skip at least one number between the modulator channel and broadcast channels.
Channels 14 and 16: OK.
Channels 14 and 15: Illegal.

Error indication: If an error has occurred or an incorrect channel is entered, the LED will flash quickly for a second and return to the previous settings.
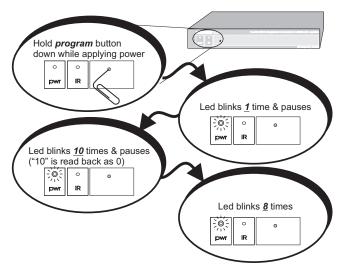
Channel number readback: A readback mode will display the current channel assignments.

To read-back modulator channel assignment

(example: 3515 has been programmed to channel **108**)

Hold **program** button down while applying power

Led blinks **1** time & pauses

Led blinks **10** times & pauses ("10" is read back as 0)

Led blinks **8** times

Things to watch for:

No picture ... Verify that the video source is on and is producing a video signal. Check that the TV and the modulator are tuned to the same channel. For example, if the modulator is broadcasting on UHF channel 16, make sure the TV is on UHF 16 rather than CATV 16. UHF 16 and CATV 16 are at different frequencies.

Weak ChannelPlus UHF channel ... If the TV has a separate UHF input, be sure that it is connected.

LEDs blink ... The display will blink if you have made an 'illegal' choice. See the section on programming.

Herringbone interference on ChannelPlus channel (diagonal lines) ... You may have chosen a channel number that is not completely vacant. Distant UHF stations may be un-watchable, but will cause interference if you try to create a new channel at the same frequency. Also, cable companies often have extra signals where there should be none. Try moving the ChannelPlus channel to another number. You may have to add a low pass filter to remove cable company noise. If a filter does not work, try adding a DC-block to remove common mode interference.

Herringbone interference on many channels, including ChannelPlus channels (disappears when you remove the CATV/Ant feed) ... The RF amplifier can be overloaded by abnormally strong signals. Often, you can cure the problem with a simple attenuator. Use a variable attenuator and try to find a signal level where the interference just disappears. Sometimes, the problem is one station that is far stronger than the rest. In this case, attenuating all of the signals with a simple attenuator will cause the desired stations to be weak (snowy). In this case you must reduce the strength of only the offending station. A common FM trap will help if the problem is a nearby FM tower. If the problem is a nearby TV station, often the station management can provide suitable filters.

Audio volume is low ... The left and right audio inputs are combined for monaural. For proper audio level, both right and left inputs must be used. If you have a mono source, connect it to both right and left inputs using an RCA 'Y' connector.

No color on ChannelPlus channels ... You may have chosen the incorrect cable standard. Not all televisions can accommodate the 1.25MHz frequency difference between the H and I cable standards. See the section on programming.

Infrared Remote Control Problems ... Use the red **IR DATA** light on the side of the modulator section as a trouble shooting aid. This light will blink as remote control signals are relayed.

If the light is on constantly, one or more IR targets is receiving electrical or optical noise. At the modulator section unit, begin to disconnect the outputs to the TVs until the **IR DATA** light goes off. This will tell you which IR target is the source of the noise.

Next cover the front of the offending IR target. If the **IR DATA** light turn off, the IR target is 'seeing' a source of IR noise, such as a solid state flourescent lamp. If the light does not go out, the problem may be radiated electrical noise from the TV. Reposition this IR target. If repositioning the IR target does not help, the TV may be conducting noise from its input. Place a DC block between the IR target and the TV.

If the **IR DATA** light seems to indicate proper operation, but the component is not being controlled, the IR emitter may be mis-located. Be sure the emitters are in front of the IR sensor.

Simple DC-block for RF   Inexpensive 0-20dB attenuator
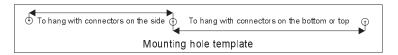
Changing modulation standards

Cable HRC and IRC considerations

Most cable services use IRC frequency assignments. This is the default for the ChannelPlus 3515 modulator. However, if the cable service uses HRC or the TV appears to search for the "house channels," the modulator can be reprogrammed to use HRC assignments by entering the number " 98". Set to IRC by entering a "99". Both of these settings are only used for setting HRC/IRC.

Common questions

Can an amplifier be used on an output to drive signals over longer cable paths? ... No. The IR remote control feature will be defeated if an external amplifier is used.

Can a splitter be used on one or more outputs in order to add more TVs? ... No. The model 3515 Multi-room Video Distribution System is a pre-engineered system providing optimum signal levels to each TV for clear, crisp picture quality. Each time a splitter is added, there is lowering of signal level called insertion loss. Insertion losses upset system performance. Additionally, the IR remote control feature will be defeated.

To hang with connectors on the side / To hang with connectors on the bottom or top

Mounting hole template

Specifications: typical @ 25°C ± 5°C

3515

Inputs	video	1 Vp-p @ 75Ω	
	audio	1 V rms @ 47kΩ	
		L & R inputs combined for monaural	
Video performance	differential gain	4%	
	differential phase	<4º	
	signal/noise	55 dB	
RF output	standard	UHF	CATV
	channel ranges	14-64	65-125 (excluding 95-99)
	output level	+15 dBmV (75dBuV)	
	IM distortion	-60 dBC	
	alternate channel	-45dBC @ 12MHz	
	Gain CATV/Ant to output	0 dB	
	Isolation (Mod in to Ant in)	85 dB (450MHz - 850MHz)	
Power supply (UL listed)	model number	350-076	
	output current	300mA	
	output voltage	15 VDC	
	input power	105-125 VAC	
	power consumption	<9 watts	
Physical	modulator section	1.0x4.6x3.5" (2.5x11.7x8.8cm)	
		0lbs 11 oz (1.19kg)	
	RF section	0.9x6.3x2.5" (2.4x16x6.4cm)	
		1 lbs 2 oz (0.5kg)	